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## Parasites on U.S. Beef Cow-calf Operations, 2007–08

Internal parasites can reduce the reproductive performance of the cow herd, reduce weaning weights of calves, and negatively impact animal health due to respiratory disease, immunosuppression, and other illnesses.

The U.S. Department of Agriculture's National Animal Health Monitoring System (NAHMS) conducted the Beef 2007–08 study, which focused on beef cow-calf health and management practices in 24 States.<sup>1</sup> These States represented 79.6 percent of U.S. cow-calf operations with beef cows and 87.8 percent of U.S. beef cows. One objective of the Beef 2007–08 study was to describe the parasite load in weaned beef calves on cow-calf operations in the United States.

### Study design and sample testing

During the Beef 2007–08 study, operations were offered the opportunity to participate in two phases of fecal testing. Fecal samples were collected from March through December 2008. In Phase 1, samples were collected from weaned beef calves 6 to 18 months of age that had been on pasture for at least 4 weeks and had not been dewormed within the previous 45 days. In Phase 2, the efficacy of the operations' current deworming programs was evaluated. Operations were instructed to deworm all animals in the pasture within 48 hours after collecting Phase 1 samples, then collect samples approximately 14 days after the deworming treatment, again from weaned beef calves aged 6 to 18 months.

During both phases, 20 fecal samples from weaned calves were collected (usually off the ground), bagged, and shipped overnight to one of three previously designated laboratories.<sup>2</sup> All labs used the Wisconsin Double Centrifugation Flotation or the Modified Wisconsin techniques. Results were expressed as eggs per gram of fecal material (EPG). Parasite eggs were

counted and identified by type (strongyle-type, *Nematodirus*, or *Trichuris*). Samples were classified as positive or negative for tapeworms and for coccidia oocysts.

### Phase 1 results

Of 567 operations, 291 indicated an interest in submitting samples for parasite evaluation. Of these, 99 submitted 1,772 Phase 1 samples that could be evaluated and reported.

Phase 1 testing found that 85.6 percent of all samples submitted were positive for strongyle-type eggs (table 1). The West region had the lowest percentage of samples positive for strongyle-type eggs (77.5 percent), and the Southeast region had the highest percentage (89.9 percent). *Nematodirus* and *Trichuris* eggs were found in 18.0 and 7.1 percent of samples, respectively.

**Table 1. Percentage of Fecal Samples Positive for Parasites, by Parasite Type and by Region**

Parasite	Percent Samples			
	Region			
	Central	Southeast	West	Total
Strongyle	87.7	89.9	77.5	85.6
<i>Nematodirus</i>	19.2	9.7	23.8	18.0
<i>Trichuris</i>	7.6	7.0	6.3	7.1
Coccidia	58.0	63.1	60.5	59.9
Tapeworm	11.9	13.0	17.5	13.7

The average EPG for strongyle-type eggs ranged from 11.3 in the West region to 58.1 in the Southeast region (table 2). Samples with zero EPG are included in the calculation of average EPG.

**Table 2. Average Eggs per Gram, by Region**

Parasite	Sample Average EPG			
	Region			
	Central	Southeast	West	Total
Strongyle	30.3	58.1	11.3	32.5
<i>Nematodirus</i>	1.0	0.2	0.9	0.8
<i>Trichuris</i>	0.2	0.2	0.1	0.1

<sup>1</sup> States/Regions:

**West:** California, Colorado, Idaho, Montana, New Mexico, Oregon, Wyoming

**Central:** Iowa, Kansas, Missouri, Nebraska, North Dakota, South Dakota

**Southeast:** Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Oklahoma, Tennessee, Texas, Virginia

<sup>2</sup> Colorado State University, Fort Collins, CO; USDA:ARS, Beltsville, MD; University of Minnesota, St. Paul, MN



## Phase 2 results

Phase 2 was conducted to determine the apparent effectiveness of current anthelmintic treatment programs for reducing the number of parasites (fecal egg counts) in U.S. cow-calf operations. A second set of fecal samples were collected approximately 14 days after the Phase 1 collection and after the animals were dewormed using the standard parasite control practices for the operation. Sixty-one operations provided usable samples for Phase 2.

Guidelines suggest that a fecal egg count reduction (FECR) test with less than 90 percent reduction indicates the presence of anthelmintic resistance (Bliss et al., 2008). Operation-level FECR was calculated by comparing the mean pretreatment egg count with the mean post-treatment egg count. Nearly one of three operations showed less than an 80 percent reduction in strongyle fecal egg count after treatment (table 3), and 44.3 percent showed less than a 90 percent reduction in strongyle egg count. The less than 90 percent FECR could be due to improper or incomplete treatment or reduced efficacy of the drugs used.

**Table 3. Fecal Egg Count Reduction Results and Types of Dewormers Used**

Parasite	Reduction Value (%)	Number Operations	Percent Operations	Number States	Operations Using Various Types of Dewormers					
					Brand Name	Generic	Brand Name	Generic	Feed	Oral
Strongyle	<80	19	31.2	10	11 (57.9)	8 (42.1)	0	0	0	0
	<90	27	44.3	11	13 (48.2)	12 (44.4)	2 (7.4)	0	0	0
	All operations	61	100.0	17	27 (44.3)	16 (26.2)	12 (19.7)	1 (1.6)	3 (4.9)	2 (3.3)
Nematodirus	<80	23	57.5	9	7 (30.5)	12 (52.2)	2 (8.7)	1 (4.3)	1 (4.3)	0
	<90	25	62.5	10	8 (32.0)	12 (48.0)	3 (12.0)	1 (4.0)	1 (4.0)	0
	All operations	40	100.0	12	17 (42.5)	14 (35.0)	5 (12.5)	1 (2.5)	1 (2.5)	2 (5.0)
Trichuris	<80	7	21.9	5	4 (57.1)	2 (28.6)	1 (14.3)	0	0	0
	<90	11	34.4	9	6 (54.5)	2 (18.2)	2 (18.2)	0	1 (9.1)	0
	All operations	32	100.0	12	15 (46.9)	10 (31.3)	3 (9.4)	1 (3.1)	1 (3.1)	2 (6.2)

## Summary

Internal parasite populations still have a major presence on U.S. beef cow-calf operations. More study is necessary to determine the extent of resistance to anthelmintic drugs among parasite populations and the best ways to ensure the effectiveness of the available drugs.

## Reference

Bliss DH, Moore RD, Kvasnicka WG. Parasite resistance in U.S. cattle. *American Association of Bovine Practitioners* 2008; 41:109-114.

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